



National Computing Education Accreditation Council NCEAC



NCEAC.DOC.001-E

COURSE DESCRIPTION

NAME OF INSTITUTION	Lahore Garrison University
PROGRAM (S) TO BE EVALUATED	Computer Science , Spring 2022

Course Description : Computer Network (CSC-343) (3+1)

Course Code	CSC343																							
Course Title	Computer Networks																							
Credit Hours	3+1																							
Prerequisites by Course(s) and Topics	Students should have a solid mathematical foundation and be familiar with basic programming concepts, data structures, Operating System and Algorithms.																							
Assessment Instruments with Weights (homework, quizzes, midterms, final, programming assignments, lab work, etc.)	SESSIONAL (Quizzes, Assignments, Presentations) =25 % Midterm Exam =25 % Final Exam = 50%																							
Course Coordinator	Mr. Attique Ur Rehman																							
URL (if any)																								
Current Catalog Description	Introduction and protocols architecture, basic concepts of networking, network topologies, layered architecture, physical layer functionality, data link layer functionality, multiple access techniques, circuit switching and packet switching, LAN technologies, wireless networks, MAC addressing, networking devices, network layer protocols, IPv4 and IPv6, IP addressing, sub netting, CIDR, routing protocols, transport layer protocols, ports and sockets, connection establishment, flow and congestion control, application layer protocols, latest trends in computer networks.																							
Textbook (or Laboratory Manual for Laboratory Courses)	• Data Communications and Networking, by Behrouz A. Forouzan, 5th edition, 2013..... • Computer Networks: A Systems Approach by Larry L. Peterson, Bruce S, Morgan Kaufmann; 5th Edition (March 25, 2011). ISBN-10: 0123850592. • Unix Network Programming, Richard Stevens, 2nd Edition																							
Reference Material	• Internetworking with TCP/IP Vol –I by Douglas E. Comer, Addison- Wesley; 5th Edition (July 10, 2005). ISBN-10: 0131876716 • High Performance Communication Networks by Jean Walrand and Pravin Varniya, Morgan Kaufmann; 2nd Edition (October 25, 1999). ISBN-10: 1558605746 • Metro Ethernet by Sam Halabi Publisher: Cisco Press ISBN: 158705096X • Computer Networks by A. S. Tanenbaum, Prentice Hall; 5th Edition (October 7, 2010). ISBN-10: 0132126958																							
Course Goals	The main aim of this exam is to introduce the field of Computer Networks. The students learn about the technical as well as the management side of Computer Networks. They acquire knowledge about fundamental principles of network and about practical approaches of Computer Networks.																							
Course Learning Outcomes (CLOs):	<table><tr><td>At the end of the course the students will be able to:</td><td>Domain</td><td>BT Level*</td></tr><tr><td>Demonstrate and distinguish between OSI and TCP/IP reference models.</td><td>Model</td><td>1,2,3,4,5</td></tr><tr><td>Demonstrate the working of Data Link Layer & Network Layer Protocols.</td><td>A</td><td>1,2,3,4,5</td></tr><tr><td>Design, implement, and analyze simple computer networks (LAN, WAN, P2P etc).</td><td>BT</td><td>1,2,3,4,5</td></tr><tr><td>Configure the routing protocols (RIPV2, OSPF, EIGRP) using Network Tool. Configure the routing protocols (RIPV2, OSPF, EIGRP) using Network Tool.</td><td>C</td><td>1,2,3,4,5</td></tr><tr><td>Design and configure the complex network using Packet Tracer tool.</td><td>A</td><td>1,2,3,4,5</td></tr><tr><td>* BT= Bloom's Taxonomy, C=Cognitive domain, P=Psychomotor domain, A= Affective domain</td><td></td><td></td></tr></table>			At the end of the course the students will be able to:	Domain	BT Level*	Demonstrate and distinguish between OSI and TCP/IP reference models.	Model	1,2,3,4,5	Demonstrate the working of Data Link Layer & Network Layer Protocols.	A	1,2,3,4,5	Design, implement, and analyze simple computer networks (LAN, WAN, P2P etc).	BT	1,2,3,4,5	Configure the routing protocols (RIPV2, OSPF, EIGRP) using Network Tool. Configure the routing protocols (RIPV2, OSPF, EIGRP) using Network Tool.	C	1,2,3,4,5	Design and configure the complex network using Packet Tracer tool.	A	1,2,3,4,5	* BT= Bloom's Taxonomy, C=Cognitive domain, P=Psychomotor domain, A= Affective domain		
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Topics Covered in the Course, with Number of Lectures on Each Topic (assume 15-week instruction and one-hour lectures)	Week	Lecture	Topics Covered
	Week 1	1	Course introduction, contents, grading policy, introduction to computer networks and applications, Network overview, prospective of network user, designer and operator, Network component, Networking media, devices and applications, Types of connections (point to point and multipoint), Classification of networks (LAN, WAN and MAN), Internet, Protocol and standards
		2	Networks Topologies (bus, star, ring and mesh), Network division (client-server, peer to peer and hybrid network), Computer network models, Layered tasks, ISO, OSI network reference model
	Week 2	3	OSI network reference model (Physical, data link, network, transport, session, presentation and application layer
		4	TCP/IP protocol suite, Network Addressing (physical, logical, port and specific)
	Week 3	5	Data Link Layer purpose, function and Services, packets and Frames, Framing protocols including character count,
		6	Flag bytes with byte stuffing, starting and ending flags with bit stuffing
	Week 4	7	Error Detection and Correction, Types of an error, Cyclic Redundancy Check (CRC)
		8	Hamming Distance, Hamming Code (7,4) and (11,7)
	Week 5	9	Codeword's, 1 bit error detection with parity and voting, Two dimensional parity
		10	Reliable Transmission: Automatic Repeat request (ARQ) algorithms
	Week 6	11	: stop and wait, concurrent logical channel and sliding window
		12	The medium access sub-layer: Pure ALOHA, Slotted ALOHA
	Week 7	13	Carrier Sense Multiple Access (CSMA), CSMA/CD and CSMA/CA protocol
		14	Ethernet Standard 802.11 : Frame format, Addressing, changes in the Ethernet standard, Fast Ethernet, Giga Ethernet Changes in the Standard
	Week 8	1 hours	Mid Term
	Week 9	15	Network Connecting devices (passive hub, active hub, repeater, , Extended LAN Bridge , Bridges, Spanning Tree algorithm , bridged network
		16	switches, router, gateway, Switched Ethernet and Full-Duplex Ethernet ,Packet switching, Introduction to wireless LAN, 802.11 and Bluetooth
	Week 10	17	Internetworking: IPv4 Addresses, Class full addressing, Classless Addressing
		18	IPv6, Differences between IPv4 and IPv6, Networks Address Translation (NAT)
	Week 11	19	ARP, RARP, ICMP,
		20	DHCP, Fragmentation
	Week 12	21	Routing Protocols
		22	Routing Protocols
	Week 13	23	Sub-Netting
		24	Sub-Netting
	Week 14	25	Transport Layer Protocols: UDP,TCP
		26	Connection Establishment, Ports and Sockets
	Week 15	27	Flow and Congestion Control
		28	Flow and Congestion Control
	Week 16	29	Application Layer Protocols
		30	Application Layer Protocols
	Week 17	2 hours	Final Term

Laboratory Projects/Experiments Done in the Course	Configuring a Cisco Router as a DHCP Server
Programming Assignments Done in the Course	Cisco Commands

Instructor Name	Mr. Attique Ur Rehman
Instructor Signature	
Date	